REMARKS

Reconsideration of the above-identified patent application in view of the amendment above and the remarks below is respectfully requested.

Claims 7 and 16 have been canceled in this paper. Claims 1, 4-5, 9-10, 13-14, 18, 20, 23 and 24 have been amended in this paper. New claim 25 has been added in this paper. Therefore, claims 1-6, 8-15 and 17-25 are pending and are under active consideration.

The drawings have been amended to include reference numerals 15-1 and 15-2 in Fig. 1 so as to be consistent with the present specification.

Claims 4 and 13 stand rejected under 35 U.S.C. 112, second paragraph, "as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention." In support of the rejection, the Patent Office states the following:

> The terms "loose fit" and "acceptable level" in claims 4 and 13 are relative terms which render the claims indefinite. The terms "loose" and "acceptable" are not defined by the claims, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention.

Without acquiescing in the propriety of the rejection, Applicants have amended claims 4 and 13 so that they no longer include the language at issue. Accordingly, for at least the above reasons, the foregoing rejection should be withdrawn.

Claims 1-2, 4-5, 7-8, 10-11, 13-14, 16-17 and 22-24 stand rejected under 35 U.S.C. 102(b) "as being anticipated by Richards, US Patent 5,547,777." In support of the rejection, the Patent Office states the following:

> Applicants' claims are directed to electrochemical stacks which include a plurality of PEM fuel cells and a reinforcing member

> peripherally surrounding the fuel cells and providing peripheral support to the stack. Richards discloses PEM fuel cells (10) surrounded by an integral housing (20) on which endplates (22) are mounted. (Figures 8 and 11, and column 17, lines 24-32.) The housing and endplates form a "reinforcing member." The end plates (22) are aluminum, and thus the reinforcing member is made of metal. Vents (25) are provided in the endplates of the reinforcing member. Individual fuel cells (10) are shown in detail in Fig. 9, and include a gasket or frame (12), bipolar plates or separators (13), and porous electrodes (14a, 14b)[.] The porosity of the electrodes provide[s] electrically-conductive means for forming fluid cavities between electrodes and the separators. As shown by Figures 8 and 10, the frames and reinforcing member are cylindrical. An annular space (27) provides electrically insulating material between the reinforcing member and the cell frames. (Column 18, lines 34-36.)
>
> With regard to claim 22, a compression pad (21) is provided in the structure described by Richards.

Insofar as the foregoing rejection pertains to claims 7 and 16, the rejection is moot in view of Applicants' cancellation herein of claims 7 and 16. Insofar as the foregoing rejection pertains to claims 1-2, 4-5, 8, 10-11, 13-14, 17 and 22-24, Applicants respectfully traverse the foregoing rejection.

Claim 1, from which claims 2, 4-5 and 8 depend, has been amended herein and now recites "[a]n electrochemical cell stack comprising:

(a) a first proton exchange membrane (PEM) electrochemical cell, said first PEM electrochemical cell comprising a first cell frame;

(b) a second PEM electrochemical cell, said first and second PEM electrochemical cells being stacked axially in a bipolar configuration, said second PEM electrochemical cell comprising a second cell frame; and

(c) a reinforcing member peripherally surrounding both said first cell frame of said first PEM electrochemical cell and said second cell frame of said second PEM electrochemical cell, said reinforcing member being dimensioned to provide external radial support to said first and second cell frames."

Support for the present amendments to claim 1 may be found, for example, in Figs. 1 and 3 of the present application which show a pair of axially stacked cells 13-1 and 13-2 radially surrounded and supported by a reinforcing member 71.

Claim 1 is neither anticipated by nor rendered obvious over Richards for at least the reason that Richards fails to teach or to suggest an electrochemical cell stack comprising, among other things, a reinforcing member that peripherally surrounds both a first cell frame of a first PEM electrochemical cell and a second cell frame of a second PEM electrochemical cell, wherein said reinforcing member is dimensioned to provide external **radial** support to the first and second cell frames.

The Patent Office is contending that the combination of housing (20) and end plates (22) of Richards corresponds to the claimed reinforcing member. Putting aside whether housing (20) and end plates (22) correspond to "a reinforcing member," it is clear that such a combination does not provide any external **radial** support to the cell frames of the PEM electrochemical cells. Richards explicitly teaches that housing (20) is to be spaced from the plurality of cells to create a cooling jacket (27) through which water is circulated to cool the stack (see col. 18, lines 24-36, of Richards). As can readily be appreciated, this would not be possible if housing (20) were providing external radial support to the cell frames as cooling jacket (27) would be eliminated. Moreover, end plates

(22), which are used to **axially** compress the plurality of cells (see col. 17, lines 31-34, of Richards), provide no external **radial** support to the respective cell frames.

Claim 5 is further patentable over Richards for the reason that Richards does not teach or suggest a reinforcing member made of a metal nor does it teach or suggest an electrically insulating material interposed between the reinforcing member and the cell frames. Instead, Richards discloses a housing (20) made of a ceramic, namely, alumina. As can readily be appreciated, if housing (20) were made of metal, it would short-circuit the stack due to its direct contact with the charged current collectors. The Patent Office appears to be contending that the cooling jacket (27) of Richards may correspond to the claimed electrically insulating material. However, as noted above, cooling jacket (27) is filled with water, which is not electrically insulating.

Claim 8 is further patentable over Richards for the reason that there is no teaching or suggestion to provide any vents in housing (20). In fact, because housing (20) is used to contain water, it would seem that it would be undesirable for housing (20) to include vents as such vents would permit water to escape from cooling jacket (27).

Independent claim 10, from which claims 11, 13, 14, 17 and 22 depend, is patentable over Richards for at least the same types of reasons given above in connection with claim 1.

Claim 14 is further patentable over Richards for the same types of reasons given above in connection with claim 5, and claim 17 is further patentable over Richards for the same types of reasons given above in connection with claim 8.

Independent claims 23 and 24 are patentable over Richards for at least the same types of reasons given above in connection with claim 1.

Accordingly, for at least the above reasons, the foregoing rejection should be withdrawn.

Claims 1-2, 4-5, 10-11, 14 and 23-24 stand rejected under 35 U.S.C. 102(e) "as being anticipated by Mease et al., US Patent 6,218,039." In support of the rejection, the Patent Office states the following:

> Mease et al. disclose a PEM fuel cell stack and a frame (104) designed to hold the fuel cell stack assembly. The fuel cells include a gasket (302) around their peripheries. (Column 3, lines 13-43, Figs. 2-4.) Note that the "frame" disclosed by Mease et al. is considered the "reinforcing member" disclosed by the applicants, and the "gasket" disclosed by Mease et al. is considered the "frame" disclosed by applicants. The Mease et al. assembly is cylindrical since it has a uniform cross-section along an axis at right angles to the base, and may be made from metal. (See column 3, lines 63-66 and Figs. 2 and 3.)

Applicants respectfully traverse the foregoing rejection. As noted above, claims 2-4 and 5 depend from claim 1. Claim 1 is neither anticipated by nor rendered obvious over Mease et al. for at least the reason that Mease et al. fails to teach or to suggest, among other things, the claimed reinforcing member. The Patent Office is apparently contending that frame (104) of Mease et al. corresponds to the claimed reinforcing member; however, as can clearly be seen from Mease et al. (see, for example, Fig. 2 of Mease et al.), frame (104) is used only to provide axial or compressive force against stack assembly (106) and does not provide any radial support to stack assembly (106).

Claim 2 is further patentable over Mease et al. for at least the reason that frame (104) is not cylindrical in shape (see Fig. 3 of Mease et al.).

Claim 5 is further patentable over Mease et al. for at least the reason that Mease et al. does not teach or suggest an electrically insulating material interposed between a metal reinforcing member and first and second cell frames.

Independent claims 10, 23 and 24 are patentable over Mease et al. for at least the same types of reasons given above in connection with claim 1. Claim 11, which depends from claim 10, is further patentable over Mease et al. for at least the same types of reasons given above in connection with claim 2, and claim 14, which depends from claim 10, is further patentable over Mease et al. for at least the same types of reasons given above in connection with claim 5.

Accordingly, for at least the above reasons, the foregoing rejection should be withdrawn.

Claims 3, 6, 12, 15 and 19 stand rejected under 35 U.S.C. 103(a) "as being unpatentable over Richards." In support of the rejection, the Patent Office states the following:

> As discussed above, Richards discloses applicants' invention essentially as claimed, with the exception that Richards does not disclose a reinforcing member formed of plastic and/or stainless steel. However, applicants invention as a whole would have been obvious to one of ordinary skill in the art, because the alumina ceramic housing and aluminum plate materials disclosed by Richards are not disclosed as critical materials, and therefore one of ordinary skill in the art would choose appropriate materials including plastics and stainless steels, based upon application requirements, material cost, material availability, etc.

Applicants respectfully traverse the foregoing rejection. Claims 3 and 6 depend from claim 1, and claims 12, 15 and 19 depend from claim 10. Claims 1 and 10 are patentable over Richards for at least the reasons given above. Therefore, based at least on their respective dependencies from claims 1 and 10, claims 3, 6, 12, 15 and 19 are patentable over Richards.

Accordingly, for at least the above reasons, the foregoing rejection should be withdrawn.

Claims 9, 18 and 20-21 stand objected to "as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims."

In response to the foregoing objection and as suggested by the Patent Office, claims 9, 18 and 20 have been rewritten in independent form to overcome the objection. Because claim 21 depends from claim 20, it is believed that claim 21 is now allowable and does not need to be re-written in independent form to overcome the rejection. Accordingly, the foregoing objection should be withdrawn.

New claim 25 depends from claim 24 and is patentable over the art of record for at least the same types of reasons given above in connection with claim 24.

In conclusion, it is respectfully submitted that the present application is in condition for allowance. Prompt and favorable action is earnestly solicited.

If there are any fees due in connection with the filing of this paper that are not accounted for, the Examiner is authorized to charge the fees to our Deposit Account No. 11-1755. If a fee is

required for an extension of time under 37 C.F.R. 1.136 that is not accounted for already, such an extension of time is requested and the fee should also be charged to our Deposit Account.

Respectfully submitted,

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I hereby certify that this correspondence is being deposited with the United States Postal Service as first class mail in an envelope addressed to: Mail Stop Fee Amendment, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450 on January 22, 2004.

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